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ABSTRACT

The results of two experiments on understanding metaphors were found to be incompatible with the popular view that deaf children have particular problems in understanding metaphorical uses of natural language. Profoundly deaf children were presented with several short stories and were instructed to select (from a set of four alternatives) the sentence they thought best completed the story. In the first experiment 46 deaf children ranging in age from 9 to 17 years clearly demonstrated their ability to understand novel metaphorical uses of English. In the second experiment ten 14-year-old deaf children who were given feedback on four initial practice items selected the correct metaphorical alternative significantly more often than those who saw no practice items. It was concluded that deaf children probably do not suffer from some special deficiency uniquely associated with metaphor. (Author/RL)

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Technical Report No. 184

THE COMPREHENSION OF METAPHORICAL USES OF ENGLISH BY DEAF CHILDREN

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Abstract

Researchers and educators of the deaf often suggest that deaf children have a particular problem in understanding metaphorical uses of natural language. This paper reports two experiments whose results are incompatible with this view. Profoundly deaf children were presented with several short stories and were instructed to select (from a set of 4 alternatives) the sentence they thought best completed the story. In Experiment 1 deaf children ranging in age from 9 to 17 years clearly demonstrated their ability to understand novel metaphorical uses of English. In Experiment 2, 14 year-old deaf children who were given feedback on four initial practice items selected the correct metaphorical alternative significantly more often than those who saw no practice items. It is concluded that deaf children probably do not suffer from some special deficiency uniquely associated with metaphor.

The Comprehension of Metaphorical Uses of English by Deaf Children

Many educators and researchers concerned with the development of language and language-related skills in the deaf believe that deaf children have a particular problem understanding metaphorical and other figurative uses of language. For example, Blackwell, Engen, Fischgrund, and Zarcadoolas (1978) state that for deaf adolescents "either something is literal or it is absurd and thus usually insignificant" (p. 138).

From a theoretical perspective, the perception of the deaf as intellectually inferior (e.g., Pintner, Eisenson, & Stanton, 1941) and as overly concrete thinkers (e.g., Myklebust, 1953), combined with the Aristotelian view of metaphor as a mark of genius mainly reserved for the esoteric language of poets, carries the implication that the deaf should suffer a special deficiency in handling metaphorical language. Even though some recent authors, especially Hans Furth, have reduced the popularity of the view that the deaf are somehow intellectually inferior (see, for example, Furth, 1964, 1966, 1969, 1973), these authors themselves have, from time to time, expressed some reservations. For example, Furth (1971) writes:

> Where deaf persons in general fall short is at the formal operative level. More precisely what happens is that they barely reach formal operating thinking, and then they cannot develop their minds much further because they do not have the tool of language. (p. 12).

Several authors investigating children's comprehension of metaphors have attempted to relate such comprehension to Piagetian stages. For example, Billow (1975) proposed that in general ". . . the comprehension of proportional metaphor is in some way related to the acquisition of formal operations" (p. 421). Cometa and Eson (1978) claimed that intersectional classification, ". . . which develops during the stage of concrete operations, serves as a necessary, logical precondition to the child's interpretation of metaphor" (p. 651). These claims imply that the comprehension of metaphor is not properly developed at least until late in the concrete operational stage.

There are, then, two theoretical orientations which, when combined, can lead to doubts about the deaf child's ability to understand metaphor. The first is the view that deaf children have problems at the level of formal operations. The second is the view (or the tendency towards it) that formal operations may be involved in the comprehension of (at least some) metaphors. The point of this observation is not to suggest that the authors we have cited routinely claim that deaf children are unable to properly understand metaphors. Rather, it is to suggest that when brought together, certain kinds of independently held views are compatible with negative expectations about the abilities of deaf children.

One of the few empirical studies investigating the deaf child's comprehension of figurative language reveals results compatible with the notion of a special deficiency. Conley (1976) compared the performance on an idiom test of deaf and hearing children matched on reading ability. She

found that above the third-grade reading level, deaf children scored significantly lower than hearing children. Conley concluded that deaf children experience special difficulty in dealing with idioms, and that this difficulty could be one of the contributing factors to the generally low reading levels of such children as compared to their hearing peers.

If deaf children do indeed suffer from some special deficiency vis a vis the comprehension of metaphors, similes, idioms, and other figurative uses of language, they could be at a serious additional educational disadvantage because instructional texts, particularly in the middle grades, are replete with such uses. It has been estimated that about two-thirds of the English language consists of idiomatic expressions (Boatner & Gates, 1969). A sample of the Ginn 360 Reading series, suitable for fifth and sixth graders, was found to contain about 10 instances of nonliteral language per 1,000 words (Arter, 1976). From 107 to 310 figures of speech were found in each reader out of four series for middle grades (Hollingsed, 1958). An average of 38 similes per book were located in a sample of children's fiction, 75% of which "were authors' attempts to communicate key ideas" (Lockhart, 1972). Similar data have been cited by Groesbeck (1961).

The main purpose of the present study was to empirically test the hypothesis that the deaf child has a special problem understanding metaphorical, as opposed to literal, uses of English, and to determine, if so, why. Essentially, two questions are addressed: First, how real or "deep-seated" is the problem? Second, what is it about being deaf that might make the comprehension of metaphorical uses of the societal language

(i.e., the general language of the hearing community) particularly difficult? Presumably, deafness deprives the child of certain experiences, both qualitatively and quantitatively, that are required to deal with the societal language in general, and perhaps of nonliteral uses of it in particular. To the extent that education can compensate for the lack of these experiences, the deaf child's problem does not really constitute a special deficiency; to the extent that it cannot, it does.

What we need to know is whether there is something about the interaction between deafness itself and metaphorical language as such that makes the comprehension of metaphorical uses of English by the deaf impossible or particularly difficult. This, for example, would be the case if the comprehension of metaphorical uses of natural languages involved some special cognitive processes not required for the comprehension of literal language, and if these processes were necessarily late in developing, or absent, in deaf but not in hearing children. Such a situation we would characterize as one of a special deficiency; an individual's performance could not be expected to improve as a result of practice because the appropriate cognitive machinery would not (yet) exist.

Alternatively, the deaf child's inability to deal with metaphorical uses of natural language in a way that is comparable to the hearing child's might be due to other, in principle remediable, causes. This could be the case if it should transpire that metaphorical language required a certain amount of experience for its adequate comprehension. Deafness, insofar as it entails a general reduction of experience of the societal language could

deprive the child of such frequent exposure as the hearing child has, so that the deaf child would normally take longer to reach a comparable level of performance. Such a case we would characterize as one involving no special deficiency; an individual's performance could be expected to improve given the right kind of training.

The problems of distinguishing between these two hypotheses are quite severe. A principal reason for this is that in the absence of some plausible hypotheses about what performance-related variables could be responsible for a child's difficulty in dealing with metaphorical language, any underlying competence could remain forever masked by them. So, any empirical investigation of the deaf child's ability to deal with metaphorical language must guard against confounding that ability (or lack of it) with other variables. For example, it is well known that deaf children have a great deal of difficulty handling certain complex syntactic structures (e.g., Quigley, Wilbur, Power, Montanelli, & Steinkamp, 1976). They also tend to have a more restricted vocabulary and a somewhat more restricted knowledge of the world as compared to their hearing peers. Therefore, unless such factors as knowledge of syntax, knowledge of vocabulary, context, familiarity of the topic, and general world knowledge are controlled, observed differences between hearing and deaf people, as well as between literal and metaphorical language, will be difficult if not impossible to interpret.

The present research investigates the comprehension of metaphors and metaphorical comparisons (similes) by deaf children. It is closely related

to the research reported by Reynolds and Ortony (in press) which dealt with second- through sixth-grade hearing children. Reynolds and Ortony found evidence of an ability to understand metaphorical uses of language in children at all grade levels they tested. They also demonstrated how certain linguistic factors having nothing specifically to do with the ability to understand metaphorical language can contaminate measures of such an ability. The present experiments used a similar approach, also attempting to examine the deaf child's ability to understand metaphorical language while controlling performance-related factors that might be masking it.

Experiment 1

Method

Subjects. Forty-six subjects were drawn from classrooms in a residential school for deaf children where signing is the primary means of communication. All subjects were profoundly and prelingually deaf, i.e., they met the following criteria: (a) sensori-neural hearing impairment of no less than 90 db (ISO) in the better ear at 500, 1000, and 2000 Hz; (b) born deaf, or deafened before the age of two years; (c) no other apparent disability apart from corrected visual defects; and (d) an IQ score, on record, of at least 87 on a performance test (usually WISC).

Subjects ranged in age from 9 to 17 years. They were predominantly white middle-class children and were approximately equally divided between males and females. Subjects were assigned to one of three groups. Group 1

included subjects 9, 10, or 11 years old with a mean age of 9 years and 7 months. Group 2 consisted of subjects 12, 13, or 14 years of age with a mean age of 13 years and 3 months. Group 3 contained subjects 15, 16, or 17 years old with a mean age of 15 years and 11 months.

Design and materials. A 2 x 3 completely randomized factorial design was used with type of metaphorical usage (simile or metaphor) and age group as between-subjects factors. There was also an external control group in which subjects were exposed only to literal items.

Associated with each of 12 short, paragraph-length, context-setting stories were three sets of four alternative sentences, a literal set, a simile set, and a metaphor set. The following example illustrates a typical story together with the three sets of alternatives.

Waiting for Mother

David's mother went on a trip. David did not see her for two weeks. He wanted to see his mother very much. One afternoon, he was playing in the yard. A car stopped in front of their house. David saw his mother in the car. He was very happy. He ran to his mother.

Literal Set

David was pleased to see his mother.

All the car windows were closed.

David came back from a trip.

The yard was covered with grass.

Simile Set

David was like a thirsty puppy finding water.

David was like a man going to the movies.

David was like a cat in the back yard.

David was like a man getting on the train.

Metaphor Set

The thirsty puppy found water.

The man went to the movies.

The cat was in the back yard.

The man was getting on the train.

The "target" alternative, the first member of each set in the above example, was assumed to fit the titled context story most appropriately. The three distracters contained elements closely associated with elements in the story or were closely similar to the target. Alternative sentences in the simile and metaphor sets were semantically identical. Accompanying each story was a hand-drawn picture illustrating the main idea behind the story.

The stories appeared, one on each page of a small booklet, each followed by one of the three sets of alternative sentences, simile sets or metaphor sets for subjects in the experimental conditions, and literal sets for subjects in the control group. The first four stories in each booklet were always practice items and were followed by eight experimental items. Each subject received the same four practice items in the same order but received a unique random order of the eight experimental items.

In constructing both the stories and the choice sets, topics familiar to the deaf were selected. Vocabulary and syntactic constructions known to be difficult for deaf children were avoided (Quigley et al., 1976); one exception to this was that many of the sentences in the simile sets unavoidably contained an embedded clause (e.g., Johnny was like a man going to the movies).

Procedure. Subjects were randomly assigned to condition. Each subject was run individually and was instructed in sign language. The subject read and simultaneously signed the story and then was shown the picture and asked "What does the picture tell about the story?" The purpose of this question, as well as subject's signing of the story, was to make sure that the story was comprehended. The subject then read and signed the alternative sentences and circled the one he or she thought best fitted the story. Subjects went through practice items first. For each practice item, after the choice was made, the subject was asked to give a reason for his or her choice. If the subject's choice was not the target, the experimenter explained why he preferred the target over the subject's choice. No such feedback was provided on experimental items.

Results and Discussion

The data of one subject had to be discarded because the subject turned out to be unable to read and understand the materials. The remaining data appear in Table 1. Subjects at all age levels performed unexpectedly well

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Insert Table 1 about here.

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on the metaphorical tasks. Assuming a chance performance level of 25%, the data provide a conservative test of deaf children's ability to comprehend metaphorical uses of language.

A 2 x 3 (metaphorical usage type x age group) analysis of variance revealed no significant main effect for type of metaphorical usage, $F(1,25) < 1$. There was, however, a significant main effect for age group, $F(2,25) = 3.413$, $p < .05$, and a significant interaction between age group and type of metaphorical usage, $F(2,25) = 4.44$, $p < .05$. A test of simple main effects was performed on age group at each of the two metaphorical usage levels. The results were significant for the metaphor condition, $F(2,25) = 6.39$, $p < .01$, but not for the simile condition, $F(2,25) = 1.47$, $p = .25$. However, this interaction should perhaps be interpreted with caution. Given the small number of subjects in each cell and the pattern of results for the simile groups, one cannot be confident about about the nature or meaning of the interaction.

The generally high level of performance by subjects in the literal condition indicates that subjects were able to perform the task of selecting the most appropriate sentence related to the story they had read. However, comparison between the literal and metaphorical conditions would not be meaningful. This is because, although the context-setting stories were identical for the literal condition and metaphorical conditions, the

alternatives in the response sets following the stories were not semantically related as they were in the metaphor and simile conditions (see the example given earlier).

It appears, therefore, that the deaf children participating in the present experiment, like their hearing peers in the Reynolds and Ortony study, suffered from no special deficiency, at least by about age 10, even though, surprisingly, the explicitness of the simile form over the metaphor form only seemed to help the youngest group. Thus, the results of Experiment 1, while showing that under suitable conditions deaf children can understand metaphorical uses of language, throw no light on what aspects of the conditions made them "suitable."

While running subjects, the experimenters noticed that subjects seemed to improve dramatically from the first to the last metaphorical practice item. It is hardly reasonable to suppose that four practice items would be enough to initiate a previously absent ability to understand metaphorical uses of language. However, it is possible that by alerting subjects to the need to entertain metaphorical interpretations, the practice items helped subjects to overcome a literal set, thus liberating already adequately developed skills at understanding metaphorical language. This possibility was reinforced by a second observation made while administering the initial practice items, namely that several subjects volunteered the information that the experiment seemed to be concerned with idioms. Since deaf children typically learn the meaning of idioms by associating an expression with an apparently unrelated meaning (e.g. kick the bucket means die), they often

assume that anything not immediately interpretable must be an idiom; that is, they assume it to be just another expression which makes no superficial sense but which has a standard meaning that they merely happen not to know. Perhaps, therefore, the practice items, by providing feedback, removed subjects' expectations that the metaphorical items involved unfamiliar idioms or uninterpretable literal uses of language. If this were the case, a critical aspect of the practice items would lie in the feedback. Experiment 2 was conducted to determine whether this was so.

Experiment 2

Method

Subjects. Ten 14-year-old profoundly deaf subjects were drawn from a residential school, different from the one used for Experiment 1, but similar in characteristics. The criteria for including subjects in the experiment were the same as those in Experiment 1.

Materials and design. The materials were those used in the metaphor condition in Experiment 1. Half of the subjects were randomly assigned to receive the four initial practice items followed by the eight experimental items. The remaining subjects received only the eight experimental items, always in the same order.

Procedure. First, subjects in the practice condition went through the four practice items in exactly the same way as in Experiment 1 except that they were run all in one group and they did not sign as they read. Then subjects in the no-practice condition joined the group. The instructions were repeated. All subjects were told that they were going to read some

short stories, that they would be seeing a picture about each story, that they would be asked a question about the picture, and that they would be required to indicate which of four alternatives best fitted the story. The subjects were then directed through these steps for each item. For responding to the question, "What does the picture tell about the story?", the experimenter selected a volunteer to respond while the other subjects looked on. For each item, subjects were reminded to find the sentence whose meaning best fitted the story.

Results and Discussion

Subjects in the practice condition performed significantly better than those in the no-practice condition. The mean number of correct responses was 63% and 20% respectively, $t(8) = 7.83$, $p < .001$. If completing the practice items is viewed as providing an opportunity for subjects to abandon a literal set, then this finding alone provides direct evidence in favor of the view that performance factors may be masking competence at dealing with metaphorical uses of language by the deaf. It also replicates the results of the first experiment in support of the hypothesis that profound deafness inflicts no special deficiency.

The question of whether it is feedback itself, or practice alone that is so effective is not directly addressed by the present experiment, but it can nevertheless be answered indirectly. If it is assumed that there was no systematic difference in item difficulty between the first four and the second four experimental items, then the first four items in the no-practice condition could be considered as constituting practice (without feedback)

for the second four items. The mean proportion correct for the first four in this condition was 15%, rising to 25% for the second four. Even if this improvement were statistically significant, it would still not represent improvement to a level of performance higher than that predicted by chance. In other words, the first four items in the no practice condition did not provide sufficient experience to result in a level of performance that would count as evidence that subjects were able to understand metaphors. On the other hand, performance on the first four items in the practice condition, following as they did four practice items with feedback, was at the 60% level, improving slightly to 65% for the second four. Thus, while in both conditions there was a tendency to improve on the second four items, the feedback clearly accounts for the huge differences, rather than mere exposure to items of the appropriate type.

The present experiment may also be regarded as a control condition for Experiment 1, suggesting that the assumption of 25% chance level is reasonable. When the conditions were not specifically in favor of metaphorical performance, subjects in the no-practice condition performed at about chance level. It seems, then, that the higher-than-chance level of performance by subjects in the practice condition and by those in the metaphorical conditions in Experiment 1 must have been due to an already existing ability to understand metaphorical uses of English.

General Discussion

The present research offers at least partial answers to the two questions it set out to investigate: How deep-seated is the deaf child's difficulty with metaphorical language, and to what can that difficulty be attributed?

The answer to the first question is provided by the combined results of both experiments. In Experiment 1, children as young as 9, 10, and 11 years old demonstrated an ability to understand metaphorical uses of English. Meanwhile, Experiment 2 showed dramatically that deaf children, while able to understand metaphorical uses of language, perhaps only rarely do so spontaneously. It suggests that failure to respond appropriately to metaphorical language may in large part be due to too strong an expectation to respond literally. However, this literal bias can apparently quite easily be overcome. Presumably, had there been a convenient way of merely telling subjects to entertain metaphorical interpretations they would have done comparably well. Based on these results, we conclude that the problem of understanding metaphorical language is probably not a deep-seated one. The results suggest the possibility that deaf children may have no special deficiency by age 10, and perhaps that they have no such deficiency at all.

Because of the difficulty of finding large populations of deaf children with the appropriate characteristics, and because of the difficulty of obtaining all the background data on each child in the sample, the present experiments, although suggestive, should certainly not be taken as definitive. A number of important variables such as IQ, linguistic ability,

hearing status of parents, and so on could not be adequately controlled. Nevertheless, the fact remains that evidence was found that deaf children can understand metaphorical uses of English, especially if their tendency to respond literally is counteracted. This finding in itself is contrary to much of the received wisdom on the deaf (see, for example, Blackwell et al., 1978). Of course, evidence of an ability to deal with metaphorical uses of English seems less surprising when one considers that deaf people, children as well as adults, use sign language metaphorically (see, for example, Klima & Bellugi, 1975, 1979), a fact that vitiates any specifically metaphor-related problem.

The second question that the present study sought to answer concerned the sources of difficulty of metaphor comprehension by deaf children. Experiment 2 suggests that a literal language set might mask the deaf child's ability to deal with metaphorical language. Experiment 1 investigated the effects of a potentially confounding linguistic variable, namely the explicitness of the metaphorical comparison. Although Reynolds and Ortony had found this to be an important factor, especially with younger hearing children, in the present experiment the older groups actually seemed to do worse with the similes than with their corresponding metaphors. Both the relatively high level of performance on the metaphorical tasks, and the fact that subjects performed close to, or above the 90% level on literal items, indicates that the stories were comprehensible and that the children understood the task. However, the materials used in the simile condition of Experiment 1 differed from those in the literal as well as those in the

metaphor conditions in two potentially important ways. First, as already mentioned, the simile condition necessarily contained sentences employing embedded clauses, a syntactic feature that has been shown to cause comprehension problems for deaf children (see, Quigley et al., 1976). Second, several of the subjects in Experiment 1 incorrectly signed the word "like" that appeared in all the alternatives in the simile condition; they signed the "love" sense rather than the "similar" sense. This suggests that some subjects may not have properly understood the alternatives, even though these subjects were corrected by the experimenters. This could account for the rather erratic performance of subjects on similes. Thus, there is some reason to believe that vocabulary and syntax may still have been (partially) obscuring subjects' ability to understand metaphorical language.

One is left, it seems, with the explanation provoked by the results of Experiment 2. Deaf children often fail to interpret language metaphorically when it would be appropriate to do so, even though they can make such interpretations. Apparently, what they fail to do spontaneously, they can do if prompted by appropriate examples, and this, if generalized, suggests that more experience with metaphorical language might increase the probability of spontaneously seeking metaphorical interpretations of superficially unintelligible language.

If the comprehension of metaphorical language by the deaf is indeed largely dependent on a history of appropriate experience with such language, one might wonder why the problem exists at all; why cannot the classroom teacher simply provide that experience? One obvious answer is that because

the societal language cannot normally be regarded as the prelingually deaf person's "first language," the deaf person, being exposed to much less of the societal language than the hearing person, will inevitably be exposed to correspondingly less metaphorical uses of it.

A second problem might be a tendency to overemphasize instruction on idioms. A disproportionate amount of instructional time spent on idioms would presumably encourage the erroneous belief that superficially anomalous linguistic strings have arbitrary meanings that are not derivable from their constituents, while at the same time depriving deaf children of the opportunity to acquire experience in making sense of novel metaphorical uses of ordinary language. The common practice of eliminating metaphorical uses of language from the reading materials to which deaf children are typically exposed is likely to exacerbate the problem of the literal set. Thus it may be that our educational practices are themselves inadvertently contributing to a systematic bias away from attempting to uncover "deeper" meanings for superficially uninterpretable strings.

References

Arter, J. L. The effects of metaphor on reading comprehension. Unpublished doctoral dissertation, University of Illinois, 1976.

Billow, R. M. A cognitive developmental study of metaphor comprehension. Developmental Psychology, 1975, 11, 415-423.

Blackwell, P. M., Engen, E., Fischgrund, J. E., & Zarcadoolas, C. Sentences and other systems: A language and learning curriculum for hearing-impaired children. Washington, D.C.: The Alexander Graham Bell Association for the Deaf, 1978.

Boatner, M. T., & Gates, J. E. A dictionary of idioms for the deaf. Washington, D.C.: National Association of the Deaf, 1969.

Cometa, M. S., & Eson, M. E. Logical operations and metaphor interpretations: A Piagetian model. Child Development, 1978, 49, 649-659.

Conley, J. E. The role of idiomatic expressions in the reading of the deaf children. American Annals of the Deaf, 1976, 121, 381-385.

Furth, H. Research with the deaf: Implications for language and cognition. Psychological Bulletin, 1964, 62, 145-162.

Furth, H. Thinking without language. New York: Free Press, 1966.

Furth, H. A thinking laboratory for deaf children. Washington, D.C.: Catholic University, 1969.

Furth, H. Education for thinking. srJournal of Rehabilitation of the Deaf, 1971, 5, 7-71.

Furth, H. Deafness and learning: A psychological approach. Belmont, Cal.: Wadsworth, 1973.

Groesbeck, H. G. The comprehension of figurative language by elementary children: A study in transfer. Unpublished doctoral dissertation, University of Oklahoma, 1961.

Hollingsed, J. C. A study of figures of speech in intermediate grade reading. Unpublished doctoral dissertation, Colorado State College, 1958.

Klima, E. S., & Bellugi, U. Wit and poetry in American Sign Language. Sign Language Studies, 1975, 8, 203-224.

Klima, E. S., & Bellugi, U. The signs of language. Cambridge, Mass.: Harvard University Press, 1979.

Lockhart, M. A description of similes from children's fiction. Unpublished master's thesis, University of Alberta, 1972.

Myklebust, H. Towards a new understanding of the deaf child. American Annals of the Deaf, 1953, 98, 345-357.

Pintner, R., Eisenson, J., & Stanton, M. The psychology of the physically handicapped. New York: Crofts, 1941.

Quigley, S. P., Wilbur, B. R., Power, J. D., Montanelli, D. S., Steinkamp, M. W. Syntactic structures in the language of deaf children. Urbana: University of Illinois, Institute for Child Behavior and Development, 1976.

Reynolds, R. E., & Ortony, A. Some issues in the measurement of children's comprehension of metaphorical language. Child Development, in press.

Table 1

Mean Percentage of Correct Responses on Literal, Simile, and Metaphor Tasks for Different Age Groups in Experiment 1

Age Group	Literal			Simile			Metaphor		
	Mean	SD	n	Mean	SD	n	Mean	SD	n
1	87.50	12.50	2	70.00	14.03	5	37.50	12.50	3
2	95.83	2.60	6	52.08	9.90	6	79.70	6.97	6
3	93.75	4.30	6	75.90	10.08	6	85.00	4.68	5

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